

New Record of *Heptacarpus jordani* (Crustacea: Decapoda: Hippolytidae) from Korea and Redescription of *Heptacarpus geniculatus*

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ABSTRACT

A hippolytid shrimp, *Heptacarpus jordani* (Rathbun, 1902), is recorded as new to Korean fauna. A redescription of *Heptacarpus geniculatus* (Stimpson, 1860) is provided. A key to six *Heptacarpus* species known from Korea is given. The Korean Hippolytidae consists now of 21 species representing nine genera.

Key words: new record, redescription, *Heptacarpus geniculatus*, *Heptacarpus jordani*, Korea

INTRODUCTION

Off the Korean coast, the Hippolytidae had been represented by 20 species belonging to nine genera, of which five species have attributed to the genus *Heptacarpus*: *H. camtschaticus* (Stimpson, 1860); *H. futilirostris* (Bate, 1888); *H. geniculatus* (Stimpson, 1860); *H. pandaloides* (Stimpson, 1860); and *H. rectirostris* (Stimpson, 1860) (Huh and An, 1997; Kim and Kim, 1997; Park and Han, 2000; Cha et al., 2001; Yang and Kim, 2004).

During ongoing survey on the Korean hippolytid fauna in 1993-1994 and 1997-2000, a further species of *Heptacarpus jordani* (Rathbun, 1902) is collected from sea grass and algal beds in the East Sea of Korea. It is a new record for the Korean hippolytid fauna. The Korean material

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of *H. jordani* is described and illustrated herein.

Heptacarpus geniculatus has reported twice from Korea so far. Kim and Park (1972) provided a photograph of the whole animal in lateral view and short description of *H. geniculatus* for the first time based on the specimens collected from Mukho and Chuksan, East Sea of Korea. However, *H. geniculatus* was excluded in the list of the Korean fauna because of the uncertainty of identification (see Kim, 1977; Kim and Kim, 1997). Recently, Huh and An (1997) listed *H. geniculatus* in the ecological study of Gwangyang Bay, southern Korea. Since there was no detailed taxonomic information of *H. geniculatus* in Huh and An's (1997) study, a redescription of *H. geniculatus* is provided.

Postorbital carapace length is abbreviated as cl. The material used in this study is housed in the Laboratory of Zoology, Silla University (SUZ) and the Laboratory of Invertebrate Zoology, Pukyong National University (PUIZ).

SYSTEMATIC ACCOUNTS

**Heptacarpus geniculatus* (Stimpson, 1860) (Fig. 1)

Hippolyte geniculata Stimpson, 1860, p. 34; Ortmann, 1890, p. 503; Doflein, 1902, p. 636.

Spirontocaris geniculata: Rathbun, 1902, p. 45, fig. 19; Yokoya, 1930, p. 530; 1933, p. 26; Urita, 1942, p. 22.

Spirontocaris alcimede De Man, 1906, p. 404; De Man, 1907, p. 416, pl. 32, figs. 42-46; Yu, 1935, p. 43.

Eualus geniculata var. *longirostris* Kobjakova, 1936, p. 211, fig. 38.

Eualus geniculata longirostris: Kobjakova, 1937, p. 121.

Heptacarpus geniculatus: Holthuis, 1947, p. 12, 44; Liu, 1955, p. 38, pl. 14, figs. 1, 2; Hayashi and Miyake, 1968, p. 132, fig. 5; Kim and Park, 1972, p. 200, pl. 3, fig. 3; Hayashi, 1979, p. 21; Holthuis, 1980, p. 127; Hayashi, 1992a, p. 111, fig. 222; Komai, 1999, p. 59.

Heptacarpus geniculata geniculata: Vinogradov, 1950, p. 211.

Spirontocaris geniculata longirostris: Kobjakova, 1958, p. 225.

Heptacarpus geniculata longirostris: Kobjakova, 1967, p. 235.

Material examined. 1 ovig. ♀ (cl 8.5 mm), Hwajinpo (Gangwon-do), 15 Jan. 1994 (J. N. Kim), by hand net from algal bed, PUIZ 142; 1 ovig. ♀ (cl 7.5 mm), Gwangyang Bay (Jeollanam-do), 17 Feb. 1994 (Y. R. An), by beam trawl from eelgrass (*Zostera*) bed at 2-4 m in depth, PUIZ 143; 1 ♀ (cl 4.7 mm), Sachon beach (Namhae-gun), 23 May 1997 (H. J. Yang), by hand net from eelgrass (*Zostera*) bed, SUZ Cr. 10121.

Description. Rostrum (Fig. 1A, B) straight, longer than carapace with 5-6 teeth on dorsal margin and 6-7 teeth on ventral margin; posterior dorsal tooth located on carapace. Carapace (Fig. 1A, B) with strong antennal spine; pterygostomian spine usually absent.

Abdomen (Fig. 1A) with third abdominal somite strongly geniculate; pleura of first four abdominal somites rounded; pleuron of fifth somite pointed posteriorly. Telson (Fig. 1A) with 4 pairs of

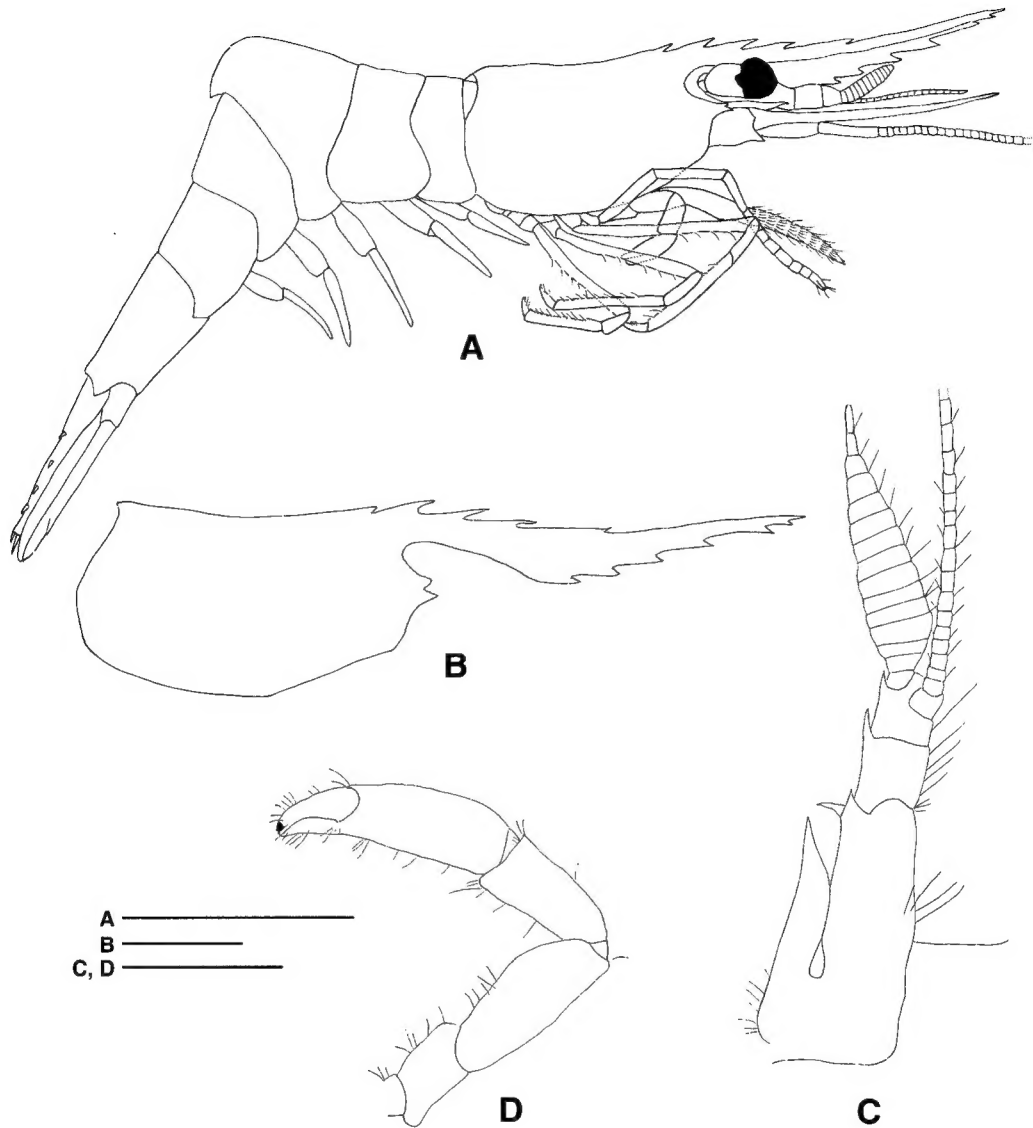


Fig. 1. *Heptacarpus geniculatus*. A, habitus, lateral; B, carapace, lateral; C, right antennule, ventral; D, left first pereopod, lateral. A-D, female (SUZ Cr. 10121, cl 4.7 mm). Scale bars = 5.0 mm (A), 2.0 mm (B), 1.0 mm (C-D).

dorsolateral spines.

Antennule (Fig. 1C) with peduncle reaching proximal 1/3 of scaphocerite; each segment with marginal spine on distolateral angle; first segment with spine near midlength of ventral margin; stylocerite slightly falling short of distal margin of first segment. Scaphocerite (Fig. 1A) long, not reaching tip of rostrum, 1.11–1.33 times as long as carapace. First pereopod (Fig. 1D) stout; merus

without prominent submarginal spine. All pereopods without epipods.

Color. Green and gray, or brownish black.

Remarks. *Heptacarpus geniculatus* is easily distinguished from other congeners by having the strongly geniculate third abdominal somite.

Biology. In Gwangyang Bay, *Heptacarpus geniculatus* is known to be one of the resident species in the eelgrass bed, and its breeding season is from February to March (Huh and An, 1997).

Development. Larval development of *Heptacarpus geniculatus* was described by Yokoya (1957), Kurata (1968), and Yamashita and Hayashi (1980).

Distribution. Korea (East Sea and southern coast), Japan, China, and southern Sakhalin. Very common in littoral weed belts.

**Heptacarpus jordani* (Rathbun, 1902) (Fig. 2)

Restricted synonymy

Spirontocaris jordani Rathbun, 1902, p. 44, fig. 17; Balss, 1914, p. 44.

Heptacarpus jordani: Hayashi, 1979, p. 25; Hayashi and Chiba, 1987, p. 920, figs. 1-3, 926; Hayashi, 1992b, p. 271, figs. 226-228.

Material examined. 1 ♀ (cl. 7.0 mm), 3 ♂ (cl. 4.9-6.5 mm), Gampo (Gyeongsangbuk-do), 15 Nov. 1993 (J. N. Kim), by hand net from algal bed at 1 m in depth, PUIZ 145; 3 ♂ (cl. 5.5, 7.9 mm), Gangyang (Busan), 13 January 1994 (J. N. Kim), by hand net from algal bed at 1 m in depth, PUIZ 146; 1 ovig. ♀ (cl. 8.9 mm), Daejin (Gangwon-do), 14 Jan. 1994 (J. N. Kim), by hand net from algal bed at 1 m in depth, PUIZ 147; 1 ♂ (cl. 5.5 mm), Namae (Gangwon-do), 15 Jan. 1994 (J. N. Kim), by hand net from algal bed at 1 m in depth, PUIZ 148; 10 ♀ (cl. 3.0-3.9 mm), Daebyeon (Busan), 17 July 2000 (H. J. Yang), by hand net from sea grass (*Phyllospadix*) bed, SUZ Cr. 10122.

Description. Rostrum (Fig. 2A, B) shorter than carapace, with 7-10 teeth on dorsal margin and 1 tooth on ventral margin near apex including 2 on carapace. Carapace (Fig. 2A, B) smooth always with antennal spine; pterygostomian spine usually present in female and present or absent in male.

Abdomen (Fig. 2A) smooth with third abdominal somite not strongly geniculate; pleura of first four abdominal somites rounded; pleuron of fifth somite acute posteriorly. Telson (Fig. 2A) with 3-6 pairs of dorsolateral spines.

Antennule (Fig. 2C) with peduncle reaching midlength of scaphocerite; first segment with spine near midlength of ventral margin and 3-5 spinules on dorsodistal margin; stylocerite reaching distal margin of second segment of antennular peduncle; second and third segments each with large marginal spine on distolateral angle. Scaphocerite (Fig. 2A) rather short, 0.61-1.00 times as long as carapace. First pereopod (Fig. 2D) stout; merus with strong submarginal spine. First to third pereopods with epipods; fourth and fifth pereopods without epipods.

Color. Light brown to dark brown or dark green (Hayashi and Chiba, 1987).

Remarks. After Rathbun (1902) described a new species of *Heptacarpus jordani* under the name of *Spirontocaris jordani* from Hokkaido, northern Japan, Hayashi and Chiba (1987) redescribed the species based on specimens collected from Miyagi Prefecture, Pacific coast of northern Japan.

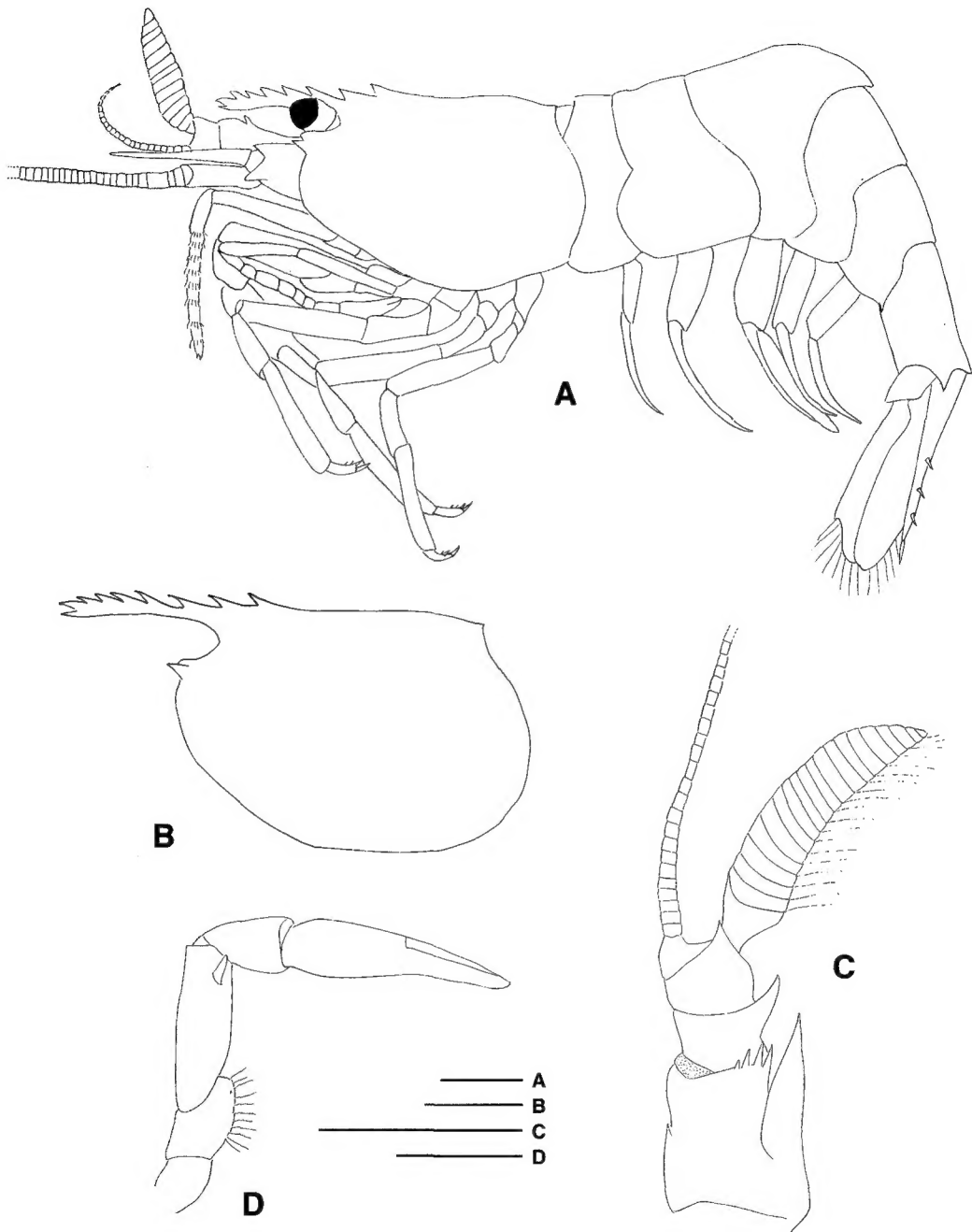


Fig. 2. *Heptacarpus jordani*. A, habitus, lateral; B, carapace, lateral; C, right antennule, dorsal; D, right first pereopod, lateral. A-D, male (PUIZ 148, cl 5.5 mm). Scale bars = 2.0 mm (A-D).

The Korean material of *H. jordani* agrees well with Hayashi and Chiba's (1987) description, especially following characters: rostral formula 7-10/1 teeth; pterygostomian spine usually present

in female, and present or absent in male; fourth abdominal pleuron lacking spine, fifth pleuron bearing spine; first segment of antennular peduncle armed with 3-5 dorsodistal spinules; and merus of first pereopod armed with submarginal spine.

Biology. In the East Sea of Korea, *Heptacarpus jordani* is rather common in sea grass and algal beds.

Ovigerous females of *H. jordani* appeared from December to June, and its life span was known to be 12 months (Hayashi and Chiba, 1987).

Development. Larval development of *Heptacarpus jordani* is unknown.

Distribution. Korea (East Sea) and Japan.

Key to *Heptacarpus* species known from Korean waters

1. Pereopods without epipods 2
 - First three pereopods each with epipod 4
2. Third abdominal somite strongly geniculate *H. geniculatus*
 - Third abdominal somite smooth, not strongly geniculate 3
3. Rostrum reaching or slightly falling short of distal margin of scaphocerite, dorsal margin with 4-7 teeth in entire length, ventral margin with 4-9 teeth; pterygostomian spine present *H. camtschaticus*
 - Rostrum overreaching distal margin of scaphocerite, dorsal margin with 7-10 teeth in proximal 1/2-3/4 length, ventral margin with 9-13 teeth; pterygostomian spine usually absent *H. pandaloides*
4. First segment of antennular peduncle with 3-5 dorsodistal spinules *H. jordani*
 - First segment of antennular peduncle with 1 dorsodistal spinule 5
5. Merus of first pereopod with large submarginal spine *H. rectirostris*
 - Merus of first pereopod without spine *H. futilirostris*

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REFERENCES

- Balss, H., 1914. Ostasiatische Decapoden II. Die Natantia und Reptantia. Abh. Bayer. Akad. Wiss., Suppl. **2**: 1-101, pl. 1.
- Bate, C. S., 1888. Report on the Crustacea Macrura collected by H.M.S. Challenger during the years 1873-76. Report on the Scientific Results of the Voyage of the H.M.S. Challenger during the Years 1873-76,

- Zool., **24**: 1-942, figs. 1-76, pls. 1-150.
- Cha, H. K., J. U. Lee, C. S. Park, C. I. Baik, S. Y. Hong, J. H. Park, D. W. Lee, Y. M. Choi, K. Hwang, Z. G. Kim, K. H. Choi, H. Sohn, M. H. Sohn, D. H. Kim and J. H. Choi, 2001. Shrimps of the Korean Waters. Nat. Fish. Res. Dev. Inst., Busan, pp. 1-188.
- Doflein, F., 1902. Ostasiatische Dekapoden. Abh. Bay. Akad. Wiss., **21**: 613-670.
- Hayashi, K. I., 1979. Studies on hippolytid shrimps from Japan-VII. The genus *Heptacarpus* Holmes. J. Shimonoseki Univ. Fish., **28**: 11-32.
- Hayashi, K. I., 1992a. Prawns, shrimps and lobsters from Japan (64). Family Hippolytidae-genera *Alope* and *Heptacarpus*. Aquabiology, **14**: 108-112.
- Hayashi, K. I., 1992b. Prawns, shrimps and lobsters from Japan (66). Family Hippolytidae-genus *Heptacarpus*. Aquabiology, **14**: 270-274.
- Hayashi, K. I. and T. Chiba, 1987. Rediscovery of *Heptacarpus jordani* (Rathbun) with notes on morphological variations (Decapoda, Caridea, Hippolytidae). Zool. Sci., **4**: 919-927.
- Hayashi, K. I. and S. Miyake, 1968. Studies on the hippolytid shrimps from Japan, V. Hippolytid fauna of the sea around the Amakusa Marine Biological Laboratory. OHMU, Occ. Pap. Zool. Lab. Kyushu Univ., **1**: 121-163.
- Holthuis, L. B., 1947. The Hippolytidae and Rhynchocinetidae collected by the Siboga and Snellius Expeditions with remarks on other species. In The Decapoda of the Siboga Expedition, Part IX. Siboga-Exped. Monogr., **39a**⁸: 1-100.
- Holthuis, L. B., 1980. FAO species catalogue. Vol. 1. Shrimps and prawns of the world. An annotated catalogue of species of interest to fisheries. FAO Fish. Synop., **125**, **1**: 1-271.
- Huh, S. H. and Y. R. An, 1997. Seasonal variation of shrimp (Crustacea: Decapoda) community in the eelgrass (*Zostera marina*) bed in Kwangyang Bay, Korea. J. Korean Fish. Soc., **30**: 532-542.
- Kim, H. S., 1977. Macrura. Vol. 19. In The Ministry of Education, ed., Illustrated Encyclopedia of Flora and Fauna of Korea. Samwha Publishing Company, Korea, pp. 1-415.
- Kim, H. S. and W. Kim, 1997. Order Decapoda. In The Korean Society of Systematic Zoology, ed., Lists of Animals in Korea (excluding Insects). Academy Publishing Co., Seoul, pp. 212-223.
- Kim, H. S. and K. B. Park, 1972. Faunal studies on the macrurans in Korea. In Floral studies on some taxa of plants and faunal studies on some taxa of animals in Korea, R-72-82, Ministry of Science and Technology, pp. 185-216, pls. 1-6.
- Kobjakova, Z. I., 1936. Zoogeographical review of the decapod fauna from the Okhotsk and Japanese Seas. Trav. Soc. Nat. Leningr., **65**: 185-228.
- Kobjakova, Z. I., 1937. Systematisch Übersicht der Dekapoden aus dem Ochotskischen und Japanischen Meere. Uchenie Zapiski Leningr. Univ., **15**: 93-154.
- Kobjakova, Z. I., 1958. Decapoda from South Kurile Islands. Invest. Far East Seas USSR, **5**: 220-248.
- Kobjakova, Z. I., 1967. Decapoda (Crustacea, Decapoda) from the Possjet Bay (the Sea of Japan). Acad. Sci. USSR, Zool. Inst., Expl. Fauna Seas, **5**: 230-247.
- Komai, T., 1999. Decapod Crustacea collected by L. Döderlein in Japan and reported by Ortmann (1890-1894) in the collection of the Musée Zoologique, Strasbourg. In Nishikawa, T., ed., Preliminary taxonomic and historical studies on Prof. Ludwig Döderlein's collection of Japanese animals made in 1880-81 and deposited at several European Museums. Nagoya University, Japan, pp. 53-101.
- Kurata, H., 1968. Larvae of Decapoda Macrura of Arasaki Sagami Bay-III. *Heptacarpus geniculatus* (Stimpson)

- (Hippolytidae). Bull. Tokai Reg. Fish. Res. Lab. **56**: 137-142.
- Liu, J. Y., 1955. Economic shrimps and prawns of northern China. Mar. Biol. Inst. Acad. Sci., Beijing, China, pp. 1-73.
- Man, J. G. de, 1906. Diagnosis of five new species of decapod Crustacea and of the hitherto unknown male of *Spirontocaris rectirostris* (Stimps.) from the Inland Sea of Japan, as also of a new species of *Palaemon* from Darjeeling, Bengal. Ann. Mag. Nat. Hist., **17**: 400-406.
- Man, J. G. de, 1907. On a collection of Crustacea, Decapoda and Stomatopoda, chiefly from the Inland Sea of Japan, with description of new species. Trans. Linn. Soc. Lond., Zool., **9**: 287-454.
- Ortmann, A., 1890. Die Unterordnung Natantia Boas: Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln gesammelten und z. Z. im Strassburger Museum aufbewahrten Formen. I. Zool. Jahrb. Abt. Syst., Geogr. Biol. Tiere, **5**: 437-542.
- Park, Y. C. and K. N. Han, 2000. Systematic study on four shrimps (Crustacea, Decapoda, Natantia) of Sokmo Channel near Kanghwa Island, Korea. Yellow Sea, **6**: 12-21.
- Rathbun, M. J., 1902. Japanese stalked-eyed crustaceans. Proc. U. S. Nat. Mus., **26**: 23-55.
- Stimpson, W., 1860. Crustacea Macrura. In Prodomus descriptonis animalium evertetratorum, quae in expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, C. Ringgold et J. Rodgers Ducibus, observavit et descripsit. Proc. Acad. Nat. Sci. Philadelphia, **1860**: 22-47.
- Urita, T., 1942. Decapod crustaceans from Sakhalin, Japan. Bull. Biogeogra. Soc. Japan, **12**: 1-78.
- Vinogradov, L. G., 1950. Classification of shrimps, prawns and crabs from Far East. Bull. TINRO, **33**: 179-358.
- Yamashita, K. and K. I. Hayashi, 1980. Larvae of Decapoda, Macrura in the vicinity of Miyazima, the Seto Inland Sea. II. *Heptacarpus pandaloides* (Stimpson) and *H. geniculatus* (Stimpson) (Caridea, Hippolytidae). Proc. Jpn. Soc. Syst. Zool., **19**: 16-23.
- Yang, H. J. and J. N. Kim, 2004. New records of hippolytid shrimps (Crustacea: Decapoda: Caridea) from Korea. Korean J. Syst. Zool., **20**: 9-19.
- Yokoya, Y., 1930. Report of the biological survey of Mutsu Bay. 16. Macrura of Mutsu Bay. Sci. Rep. Tohoku Imp. Univ., 4th Series (Biology), **5**: 525-548, pl. 1.
- Yokoya, Y., 1957. The Larvae of Caridea. In Suehiro, Y., Y. Oshima, and Y. Hiyama, eds., Suisangaku Shusei, University of Tokyo Press, Tokyo, pp. 537-552.
- Yu, S. C., 1935. Sur la famille des Hippolytidae de la Chine. Chin. J. Zool., **1**: 41-54.

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한국 미기록 동해좁은빨꼬마새우 (갑각강, 십각목, 꼬마새우과)와
흑등좁은빨꼬마새우의 재기재

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요 약

꼬마새우류인 동해좁은빨꼬마새우 (*Heptacarpus jordani*)가 한국 미기록종으로 판명되어 보고한다. 흑등좁은빨꼬마새우 (*H. geniculatus*)는 재기재하였다. 한국산 좁은빨꼬마새우속 6종에 대한 검색표를 제시하였다. 현재 한국산 꼬마새우과는 9속 21종이다.